IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	Yu DENG et al.	§	Confirmation No.:	5355
Serial No.:	10/797,266	§	Group Art Unit:	2165
Filed:	03/10/2004	§	Examiner:	T. Ponikiewski
For:	Metadata-Related Mappings In A System	§	Docket No.:	200314604-1

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Date: September 26, 2007

Sir:

Appellants hereby submit this Appeal Brief in connection with the above-identified application. A Notice of Appeal was filed via facsimile on August 14, 2007.

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I. REAL PARTY IN INTEREST

The real party in interest is the Hewlett-Packard Development Company (HPDC), a Texas Limited Partnership, having its principal place of business in Houston, Texas. HPDC is a wholly owned affiliate of Hewlett-Packard Company (HPC). The Assignment from the inventors to HPDC was recorded on March 10, 2004, at Reel/Frame 015081/0451.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

Originally filed claims:	1-25.
Claim cancellations:	None.
Added claims:	None.
Withdrawn claims:	1-10 and 21-25.
Presently pending claims:	11-20.
Presently appealed claims:	11-20.

IV. STATUS OF THE AMENDMENTS

Appellants submitted an amendment on August 23, 2007 before filing the Appeal Brief. The Examiner entered the amendments in an Advisory Action dated August 30, 2007 and indicated the amendments overcame the previous rejection of claims 12 and 19 under 35 U.S.C. § 112, second paragraph.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claims.

Appellants' disclosure describes a metadata system that permits algebraic and functional relationships to be established between resources using "virtual properties." Virtual properties are functional mappings that possess derived values rather than stored values. Each function may relate to one or more parameters defined by other resources (see Figure 3 and paragraph [0024], lines 1-14). Appellants' contribution involves setting up and maintaining a virtual property and its associated function, calculating and retrieving values for the function, mapping dependency chains to enable instantiation of the function, and maintaining the mapping should any changes to the dependency chains or ontologies occur (see Figure 10 and paragraph [0043], lines 1-14).

The term "functional relationship," as used in Appellants' claims, relates to values that are derived functionally rather than values that are simply stored (see Appellants' specification, paragraph [0024], lines 3-5). As an example, paragraph [0024] of Appellants' specification refers to calculating a "total cost" based on a function.

The invention of claim 11 is directed to a method performed by at least one processor (see 106, 108 of Figure 1). The method comprises generating a node (206 of Figures 3, 4 and 5A) to represent a functional relationship between one or more objects of distinct ontologies in a metadata system (see paragraph [0022], lines 2-4 and paragraph [0024], lines 1-14). The method further comprises associating an expression of the functional relationship to the node (206) and associating one or more parameters (208, 210 of Figures 3 and 4) of the

functional relationship to the node (see paragraph [0026], lines 1-10; paragraph [0027], lines 1-8; paragraph [0028], lines 1-9; and Figures 6 and 9).

The invention of claim 18 is directed to a computer readable medium (110 of Figure 1) storing a program executable by a processor (see 106, 108 of Figure 1), the program causes the processor to generate a node (206 of Figures 3, 4 and 5A) to represent a functional relationship between one or more objects of distinct ontologies in a metadata system (see paragraph [0022], lines 2-4 and paragraph [0024], lines 1-14). The program also causes the processor (106) to link to the node an expression of the functional relationship and to link one or more parameters (208, 210 of Figures 3 and 4) of the functional relationship to the node (see paragraph [0026], lines 1-10; paragraph [0027], lines 1-8; paragraph [0028], lines 1-9; and Figures 6 and 9).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 11-12, 15 and 17-19 are anticipated by U.S. Pat. No. 7,139,973 ("*Kirkwood*").

Whether claims 13-14 and 20 are obvious over *Kirkwood* in view of U.S. Pat. App. Pub. No. 2004/0243613 A1 ("*Pourheidari*").

Whether claim 16 is obvious over *Kirkwood* in view of U.S. Pat. App. Pub. No. 2004/0083199 A1 ("*Govindugari*").

VII. ARGUMENT

A. The *Kirkwood* Reference

Kirkwood involves dynamically generating an electronic document based on a user query. Each user query contains a concept and an information type or document type. "Information objects" that match the user query are included in an electronic document that is delivered to the user (see col. 3, lines 12-29). *Kirkwood* also caches related information objects together for rapid generation and delivery of the electronic documents (see col. 3, line 30 – col. 4, line 6). *Kirkwood* does not teach nodes having functional relationships (based on derived values) as does Appellants' claimed invention.

B. Whether claims 11-12, 15 and 17-19 are anticipated by *Kirkwood*

The Examiner improperly rejected claims 11-12, 15 and 17-19 as being anticipated by *Kirkwood*. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). As set forth below, *Kirkwood* fails to teach at least one element of each claim and thus the Examiner's rejections are improper.

With respect to claim 11, *Kirkwood* fails to teach "generating a node to represent a functional relationship between one or more objects of distinct ontologies in a metadata system" as is required. The Examiner refers to col. 11, line 66 – col. 12, line 7 of *Kirkwood* as teaching the above limitation. Although the paragraph cited by the Examiner mentions a node and a relationship, *Kirkwood* is still deficient in teaching "a functional relationship between one or more objects of distinct ontologies in a metadata system" as set forth below.

Kirkwood's node lacks "a functional relationship" as is required in claim 11. The term "functional relationship," as used by Appellants and as would be understood by one of skill in the art, relates to values that are derived functionally

rather than values that are simply stored (see Appellants' specification, paragraph [0024], lines 3-5). *Kirkwood* does not teach nodes having functional relationships, but instead teaches nodes having stored vocabulary relationships that are not derived. As an example of this difference, paragraph [0024] of Appellants' specification refers to calculating a "total cost" based on a function while Figures 6A-6C of *Kirkwood* illustrate methods for storing, filtering and retrieving vocabulary data without calculating values of a function.

Claim 11 also recites the limitations "associating an expression of the functional relationship to the node" and "associating one or more parameters of the functional relationship to the node," which clarify that the "functional relationship" of claim 11 involves an "expression" and "parameters." In other words, the "functional relationship" of claim 11 involves a mathematical "expression" having "parameters." The Examiner cites col. 17, lines 16-23 of *Kirkwood* as teaching these limitations. Although *Kirkwood* uses the terms "expression" and "parameters," it would be clear to one of skill in the art that these terms simply describe a relationship between stored values rather than mathematically derived values as in claim 11. For at least these reasons, claim 11 is allowable over *Kirkwood*.

Furthermore, *Kirkwood* does not teach "objects of distinct ontologies in a metadata system" as is required in claim 11. The Examiner cites columns 11 and 12 of *Kirkwood* as teaching the above limitation. However, *Kirkwood* does not teach distinct ontologies as is required. As indicated by Appellants' specification (see paragraph [0018]) and by *Kirkwood* (see col. 11, lines 28-31), an ontology creates an agreed-upon vocabulary for exchanging information. *Kirkwood* only discusses a single ontology for modeling relationships between concepts (see col. 11, line 26 – col. 12, line 48) and thus does not teach distinct ontologies as is required in claim 11. For at least this additional reason, claim 11 is allowable over *Kirkwood*. Based on the foregoing, Appellants respectfully submit that the rejection of claim 11 and its dependent claims be reversed and the claims set for issue.

With respect to claim 18, *Kirkwood* fails to teach a program that causes a processor to "generate a node to represent a functional relationship between one or more objects of distinct ontologies in a metadata system" as is required. The Examiner refers to col. 11, line 66 – col. 12, line 7 of *Kirkwood* as teaching the above limitation. Although the paragraph cited by the Examiner mentions a node and a relationship, *Kirkwood* is still deficient in teaching "a functional relationship between one or more objects of distinct ontologies in a metadata system" as set forth below.

Kirkwood's node lacks "a functional relationship" as is required in claim 18. The term "functional relationship," as used by Appellants and as would be understood by one of skill in the art, relates to values that are derived functionally rather than values that are simply stored (see Appellants' specification, paragraph [0024], lines 3-5). *Kirkwood* does not teach nodes having functional relationships, but instead teaches nodes having stored vocabulary relationships that are not derived. As an example of this difference, paragraph [0024] of Appellants' specification refers to calculating a "total cost" based on a function while Figures 6A-6C of *Kirkwood* illustrate methods for storing, filtering and retrieving vocabulary data without calculating values of a function.

Claim 18 also recites limitations requiring that the processor "link to the node an expression of the functional relationship" and "link one or more parameters of the functional relationship to the node," which clarify that the "functional relationship" of claim 18 involves an "expression" and "parameters." In other words, the "functional relationship" of claim 18 involves a mathematical "expression" having "parameters." The Examiner cites col. 17, lines 16-23 of *Kirkwood* as teaching these limitations. Although *Kirkwood* uses the terms "expression" and "parameters," it would be clear to one of skill in the art that these terms simply describe a relationship between stored values rather than mathematically derived values as in claim 18. For at least these reasons, claim 18 is allowable over *Kirkwood*.

Furthermore, *Kirkwood* does not teach "objects of distinct ontologies in a metadata system" as is required in claim 18. The Examiner cites columns 11 and

12 of *Kirkwood* as teaching the above limitation. However, *Kirkwood* does not teach distinct ontologies as is required. As indicated by Appellants' specification (see paragraph [0018]) and by *Kirkwood* (see col. 11, lines 28-31), an ontology creates an agreed-upon vocabulary for exchanging information. *Kirkwood* only discusses a single ontology for modeling relationships between concepts (see col. 11, line 26 – col. 12, line 48) and thus does not teach distinct ontologies as is required in claim 18. For at least this additional reason, claim 18 is allowable over *Kirkwood*. Based on the foregoing, Appellants respectfully submit that the rejection of claim 18 and its dependent claims be reversed and the claims set for issue.

C. Whether claims 13-14 and 20 are obvious over *Kirkwood* in view of *Pourheidari*

Pourheidari does not overcome the deficiencies of *Kirkwood* and thus claims 13-14 and 20 are allowable for the same reasons provided with respect to claims 11 and 18. Furthermore, claims 13-14 and 20 are patentable for at least the following reason. The publication date of *Pourheidari* (December 2, 2004) is after Appellants' filing date (March 10, 2004). Thus, *Pourheidari* would only qualify as prior art under 35 U.S.C. § 102(e). As 35 U.S.C. § 103(c) states, "Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

The inventors of the *Pourheidari* reference (see Assignment Reel/Frame 013961/0175) and the present application (see Assignment Reel/Frame 015081/0451) were, at the time of filing the present application, subject to an obligation of assignment to a common assignee, as supported by the assignments filed with respect to each application. Accordingly, because the *Pourheidari* reference is available as a prior art reference only under § 102(e), and because the inventors of the *Pourheidari* reference and the present application were, at the time of filing the present application, subject to an

obligation of assignment to a common assignee, Appellants respectfully submit that the *Pourheidari* reference may not be used in an obviousness rejection against the claims of the present application, alone or in combination with any other reference. For at least this reason, the Examiner's obviousness rejections of claims 13-14 and 20 are improper. Based on the foregoing, Appellants respectfully submit that the rejection of claims 13-14 and 20 be reversed and the claims set for issue.

D. Whether claim 16 is obvious over *Kirkwood* in view of *Govindugari*

Claim 16 depends on and inherits the limitations of claim 11. *Govindugari* does not satisfy the deficiencies of *Kirkwood* and thus the Examiner erred in rejecting claim 16 for much same reasons articulated previously with respect to claim 11. Furthermore, claim 16 is patentable for at least the following reasons. Claim 16 requires "utilizing heuristics to suggest alternative mappings between dependency chains." The Examiner recognizes that *Kirkwood* does not teach Appellants' heuristics limitation and relies on *Govindugari* to teach the limitation. Final Office Action dated 06/05/07, page 7, item 11. The teachings of *Govindugari* regarding heuristics are vague and are not clearly utilized "to suggest alternative mappings between dependency chains" as is required in claim 16. Specifically, *Govindugari* mentions structural heuristics to add weight for each sibling, child or ancestor relationship where a viable mapping was previously established (see paragraph [0201]). Adding weight to existing mappings as in *Govindugari* does not necessarily imply that alternative mappings between dependency chains are suggested as is required in claim 16.

Furthermore, *Govindugari's* semantic modeling and model mapping can be labor intensive (see paragraph [0189]). Thus, there is no motivation to combine *Govindugari* with *Kirkwood* as is suggested by the Examiner. One of skill in the art would not think to combine *Kirkwood's* efficient caching system with *Govindugari's* labor intensive modeling system at least because *Govindugari's* modeling system would undesirably interfere with and/or increase the labor involved with *Kirkwood's* caching system. See MPEP § 2143.01 ("The Proposed

Modification Cannot Render The Prior Art Unsatisfactory For Its Intended Purpose"). For at least these reasons, individually or together, the Examiner's obviousness rejection of claim 16 is improper. Based on the foregoing, Appellants respectfully submit that the rejection of claim 16 be reversed and the claim set for issue.

E. Conclusion

For the reasons stated above, Appellants respectfully submit that the Examiner erred in rejecting all pending claims. It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Hewlett-Packard Development Company's Deposit Account No. 08-2025.

Respectfully submitted,

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VIII. CLAIMS APPENDIX

1. (Withdrawn) A system, comprising:

a processor;

storage coupled to the processor and containing elements of metadata belonging to a plurality of schemas; and

mappings between the elements of metadata, each mapping being expressed as metadata and comprising a processor executable functional expression that relates the elements of metadata together.

2. (Withdrawn) The system of claim 1 wherein the elements of metadata comprise processor readable objects selected from the group consisting of resources, properties, and literals.

3. (Withdrawn) The system of claim 1 wherein the metadata comprises processor readable objects selected from the group consisting of dictionaries, catalogs, and directories.

4. (Withdrawn) The system of claim 1 wherein the functional expressions comprise processor readable parameters that represent a resource that aggregates a name, type, and parameter path.

5. (Withdrawn) The system of claim 1 wherein the functional expressions comprise processor readable parameters that represent a resource aggregating a type and a parameter path and that is connected to a name through an explicit mapping.

6. (Withdrawn) The system of claim 1 wherein a value of a previously calculated functional expression is cached in the storage.

7. (Withdrawn) The system of claim 1 wherein reasoning tasks are defined over the mappings.

8. (Withdrawn) The system of claim 1 further comprising processor readable dependency chains that define dependent relationships between properties of parameter paths of the functional expressions.

9. (Withdrawn) The system of claim 8 wherein the dependency chains are constructed using sub-properties of a transitive property that distinguishes dependency chains with common parameter subpaths.

10. (Withdrawn) The system of claim 8 wherein the dependency chains comprise dependency chains that are validated between the plurality of schemas.

11. (Previously presented) A method performed by at least one processor, the method comprising:

generating a node to represent a functional relationship between one or more objects of distinct ontologies in a metadata system;

associating an expression of the functional relationship to the node; and

associating one or more parameters of the functional relationship to the node.

12. (Original) The method of claim 11 further comprising associating a dependency chain representing the dependent relationships between properties of a parameter path associated with the one or more parameters of the functional relationship.

13. (Original) The method of claim 11 wherein associating one or more parameters comprises generating a resource that aggregates a local name, type, and dependency chain.

14. (Original) The method of claim 11 wherein associating one or more parameters comprises generating a resource that aggregates a type and a dependency chain and that is associated to a name through an explicit mapping.

15. (Original) The method of claim 11 further comprising identifying mappings between dependency chains spanning the distinct ontologies.

16. (Previously presented) The method from claim 15 wherein the identifying further comprises utilizing heuristics to suggest alternative mappings between dependency chains.

17. (Original) The method of claim 15 further comprising maintaining the mappings that span the distinct ontologies when one of the distinct ontologies is modified.

18. (Previously presented) A computer readable medium storing a program executable by a processor, the program causes the processor to:

generate a node to represent a functional relationship between one or more objects of distinct ontologies in a metadata system;

link to the node an expression of the functional relationship; and

link one or more parameters of the functional relationship to the node.

19. (Original) The computer readable medium of claim 18 wherein the program further causes the processor to connect a dependency chain representing the dependent relationships between properties of a parameter path.

20. (Original) The computer readable medium of claim 18 wherein the program further causes the processor to connect one or more parameters comprising generating a blank node that aggregates a local name, type, and dependency chain.

21. (Withdrawn) A system, comprising:

a means for executing instructions;

a means for storing elements of metadata belonging to a plurality of schemas; and

a means for mapping the elements of metadata, the means for mapping comprising processor readable functional expressions executable by the means for executing instructions.

22. (Withdrawn) The system of claim 21 wherein the elements of metadata comprise processor readable objects selected from the group consisting of resources, properties, and literals.

23. (Withdrawn) The system of claim 21 wherein the functional expressions comprise processor readable parameters representing the elements of metadata, the parameters comprising blank nodes that aggregate a name, type, and parameter path.

24. (Withdrawn) The system of claim 21 wherein the processor readable functional expressions comprise parameters representing the elements of metadata, the parameters comprising resources that are connected to a name through an explicit mapping.

25. (Withdrawn) The system of claim 21 wherein a value of a previously calculated functional expression is cached in the means for storing elements of metadata.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.